

## **Assignment Sheet / Density Test**

Project Number: 23502-ZS9Lab. Tech: K. FordProject Name: HSRDate Completed: 9/17/13Date Drilled: 9/3/13Boring: S0021R

Sample	Depth	Tests	Soil Wt	Length	Diameter	Wet Wt	Dry Wt	Wet	Moisture	Dry	Soil
			Gms	in	in	Gms	Gms	Density	%	Density	Classification
B01	0-5.0	SA				200	195.6		2.2%		SM
MC02-1	6.0-6.5	DD,DS	691.1	5.12	2.42	131	125.4	111.8	4.5%	107.1	SM
SS03	11.0-11.5	DD,SA	263.9	6.00	1.43	264	218.7	103.8	20.7%	86.0	ML
SS05	21.0-21.5	SA				359	305.6		17.3%		SM/SP
MC06-1	26.0-26.5	DD,SA	801.6	6.02	2.42	200	177.9	110.3	12.4%	98.1	SP
MC08-1	36.0-36.5	DD,DS,SA	766.3	4.87	2.42	143	128.9	130.4	10.9%	117.6	SM
MC10-2	46.0-46.5	DD	866.1	6.02	2.42	114	95.4	119.2	19.3%	99.9	SP
SS11	51.0-51.5	SA				261	233.3		11.9%		SM
SS13	61.0-61.5	DD,SA	281.3	6.00	1.43	281	249.7	110.6	12.7%	98.2	SM
MC14-2	65.5-66.0	DD,SA	847.9	6.02	2.42	200	176.0	116.7	13.6%	102.7	SP
MC16-2	75.5-76.0	DD,SA	786.7	6.02	2.42	200	186.6	108.3	7.2%	101.0	SP
SS17	81.0-81.5	SA				279	244.5		14.3%		SM/SP

Notes:

CHEM Sulfate/Chloride MR Minimum Resistivity COLL Collapse РΗ pH Test CON 1D Consolidation PI Atterberg Limits **CURV** Modified Proctor RV R-value DD Moisture Density SA Sieve Analysis DS **Direct Shear** TRX Triaxial Compression

HY Hydrometer



## **Assignment Sheet / Density Test**

Project Number : 23502-ZS9 Lab. Tech : K. Ford Project Name : HSR Date Completed : 1/20/14

Date Drilled : 1/8/14

Boring	Sample	Depth	Tests	Soil Wt	Length	Diameter	Wet Wt	Dry Wt	Wet	Moisture	Dry	Soil
				Gms	in	in	Gms	Gms	Density	%	Density	Classification
	MC03-2		SA				200	174.1		14.9%		SP
S0019AR	SS06	30-31.5'	SA				200	181.5		10.2%		SM/SP
S0020R	SS07	25-26.5'	SA				200	167.7		19.3%		SM
S0021R	MC10-1	46-46.5'	SA				200	180.2		11.0%		SM/ML
S0021R	MC18-1	86-86.5'	SA				200	184.8		8.2%		SP
S0021R	SS07	30-31.5'	SA				200	171.3		16.8%		SM/SP
S0029R		30.9-31.4'	SA				200	174.1		14.9%		SM
S0031R	MC03-2	10.4-11	SA				200	166.5		20.1%		SP
S0031R	SS08	35-36.5'	SA				200	175.4		14.0%		SM
S0034BR	MC09-1	41-41.5'	HY,SA									SM/ML
S0065R	MC04-2	15.5-16'	SA				200	172.6		15.9%		SM/SP
S0066R	MC03-2	10-11.5'	SA				200	172.0		16.3%		SM
S0067R	MC06-1	25-26.5'	SA				200	169.4		18.1%		SP
S0067R	MC11-1	45-46.5'	HY,SA									SM
S0067R	MC23-1	95-96.4'	HY,SA									SM
S0070R	MC09-2	40.5-41'	HY,SA									SM
S0070R	U05	20-22'	HY,SA									SM
S0072R	MC12-1	51-51.5'	HY,SA									SM
S0073R	MC11-2	45.5-16'	HY,SA									ML/CL
			,									

Notes:

CHEM Sulfate/Chloride MR Minimum Resistivity COLL Collapse РΗ pH Test CONSOL 1D Consolidation Ы Atterberg Limits CURV Modified Proctor RV R-value DD Moisture Density RVT R-value Treated

DS Direct Shear SA Sieve Analysis
HY Hydrometer TRX Triaxial Compression



# Sieve Analysis for Soil / Fine Aggregate ASTM C-136

 Project:
 CA HSR
 Technician:
 K. Ford

 Date:
 9/17/2013

 TES#:
 23502-ZS9
 Sample No.:
 B-01

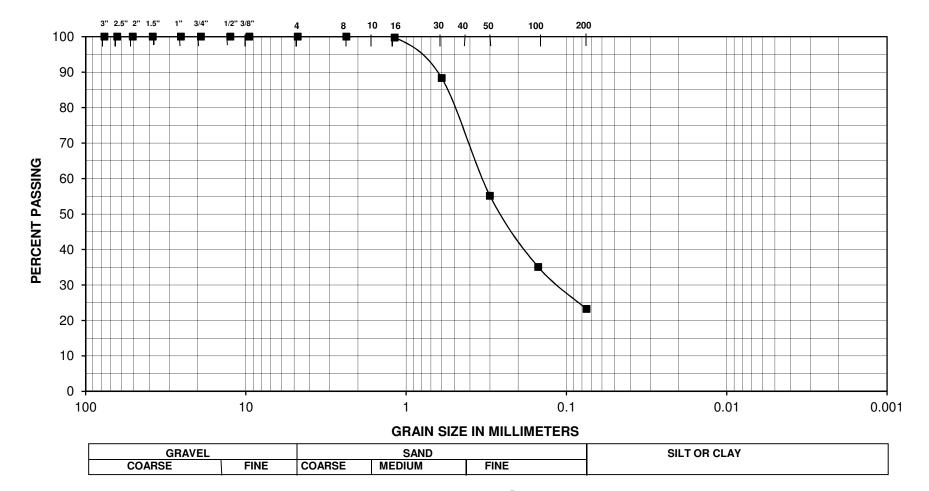
 Boring #:
 S0021R
 Classification:
 (SM) Silty Sand

	Weight	Maximum	Minimum Weight of
	(lbs. or grams)	Sieve Size	Test Specimen, lbs. (kg)
Total Dry Sample + Tare Wt.		Sand	1.0 (0.5)
Tare Weight		3/8"	2.0 (1.0)
Total Dry Sample Wt.	195.6	1/2"	4.0 (2.0)
Initial Weight Fine		3/4"	11.0 (5.0)
Aggregate Before Wash	195.6	1"	22.0 (10.0)
Final Weight Fine		1 1/2"	33.0 (15.0)
Aggregate After Wash	153.9	2"	44.0 (20.0)

	Cumulative	Individual	Cumulative	Cumulative	
Ciava					
Sieve	Weight	Weights	%	%	_
Size	Retained	Retained	Retained	Passing	Specs.
3 in.			0.0	100.0	
2 1/2 in.			0.0	100.0	
2 in.			0.0	100.0	
1 1/2 in.			0.0	100.0	
1 in.			0.0	100.0	
3/4 in.			0.0	100.0	
1/2 in.			0.0	100.0	
3/8 in.			0.0	100.0	
#4	0.0	0.0	0.0	100.0	
#8	0.0	0.0	0.0	100.0	
#16	0.5	0.5	0.3	99.7	
#30	22.8	22.3	11.7	88.3	
#50	87.7	64.9	44.8	55.2	
#100	127.0	39.3	64.9	35.1	
#200	150.1	23.1	76.7	23.3	
Pan	153.9				



#### **U.S. STANDARD SIEVE NUMBERS**



—**■**— B-01

Sample #	Classification	% Gravel	% Sand	% Silt	% Clay	% Moist.	LL	PL	PI	Project:	CA HSR
B-01	(SM) Silty Sand	0	76.7	23.3							
										TES#:	23502-ZS9
										Boring #	S0021R
										Date:	9/17/2013



# Sieve Analysis for Soil / Fine Aggregate ASTM C-136

 Project:
 CA HSR
 Technician:
 K. Ford

 Date:
 9/17/2013

 TES#:
 23502-ZS9
 Sample No.:
 SS03

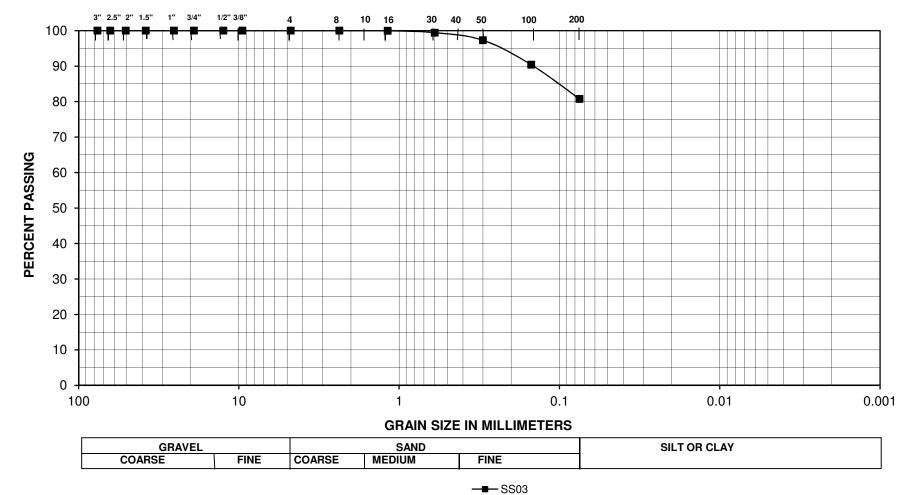
 Boring #:
 S0021R
 Classification:
 (ML) Sandy Silt

	Weight	Maximum	Minimum Weight of
	(lbs. or grams)	Sieve Size	Test Specimen, lbs. (kg)
Total Dry Sample + Tare Wt.		Sand	1.0 (0.5)
Tare Weight		3/8"	2.0 (1.0)
Total Dry Sample Wt.	218.7	1/2"	4.0 (2.0)
Initial Weight Fine	218.7	3/4"	11.0 (5.0)
Aggregate Before Wash	210.7	1"	22.0 (10.0)
Final Weight Fine	45.8	1 1/2"	33.0 (15.0)
Aggregate After Wash	<del>4</del> 0.0	2"	44.0 (20.0)

	0	La alta dala dal	0	0	
	Cumulative	Individual	Cumulative	Cumulative	
Sieve	Weight	Weights	%	%	
Size	Retained	Retained	Retained	Passing	Specs.
3 in.			0.0	100.0	
2 1/2 in.			0.0	100.0	
2 in.			0.0	100.0	
1 1/2 in.			0.0	100.0	
1 in.			0.0	100.0	
3/4 in.			0.0	100.0	
1/2 in.			0.0	100.0	
3/8 in.			0.0	100.0	
#4	0.0	0.0	0.0	100.0	
#8	0.0	0.0	0.0	100.0	
#16	0.1	0.1	0.0	100.0	
#30	1.2	1.1	0.5	99.5	
#50	5.9	4.7	2.7	97.3	
#100	21.0	15.1	9.6	90.4	
#200	42.1	21.1	19.3	80.7	
Pan	45.8				



#### **U.S. STANDARD SIEVE NUMBERS**



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Sample #	Classification	% Gravel	% Sand	% Silt	% Clay	% Moist.	LL	PL	PI	Project:	CA HSR
SS03	(ML) Sandy Silt	0	19.3	80.7	0.0						
										TES#:	23502-ZS9
										Boring #	S0021R
										Date:	9/17/2013



# Sieve Analysis for Soil / Fine Aggregate ASTM C-136

 Project:
 CA HSR
 Technician:
 K. Ford

 Date:
 9/17/2013

 TES#:
 23502-ZS9
 Sample No.:
 SS05

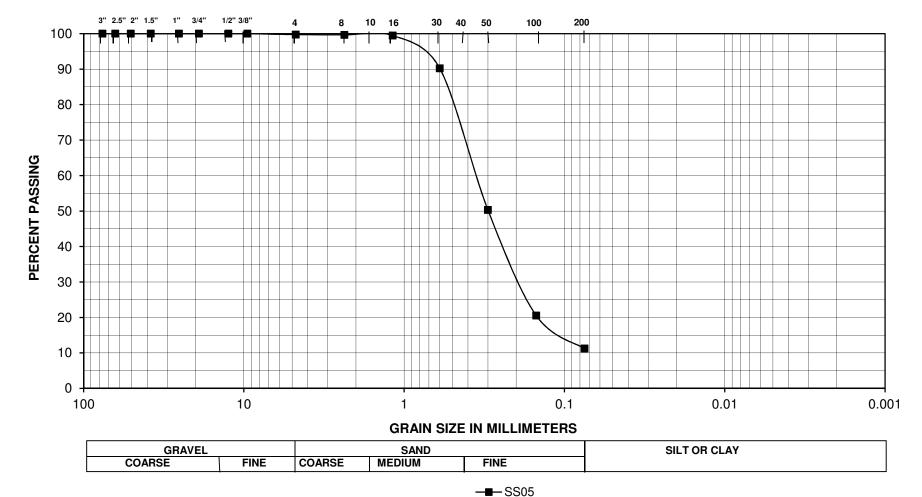
 Boring #:
 S0021R
 Classification:
 (SP) Poorly Graded Sand

	Weight (lbs. or grams)	Maximum Sieve Size	Minimum Weight of Test Specimen, lbs. (kg)
Total Dry Sample + Tare Wt.	_ ` <u> </u>	Sand	1.0 (0.5)
Tare Weight		3/8"	2.0 (1.0)
Total Dry Sample Wt.	305.6	1/2"	4.0 (2.0)
Initial Weight Fine	205.6	3/4"	11.0 (5.0)
Aggregate Before Wash	305.6	1"	22.0 (10.0)
Final Weight Fine	074.5	1 1/2"	33.0 (15.0)
Aggregate After Wash	274.5	2"	44.0 (20.0)

	Cumulative	Individual	Cumulative	Cumulative	
Sieve	Weight	Weights	%	%	
Size	Retained	Retained	Retained	Passing	Specs.
3 in.			0.0	100.0	
2 1/2 in.			0.0	100.0	
2 in.			0.0	100.0	
1 1/2 in.			0.0	100.0	
1 in.			0.0	100.0	
3/4 in.			0.0	100.0	
1/2 in.			0.0	100.0	
3/8 in.			0.0	100.0	
#4	0.8	0.0	0.3	99.7	
#8	1.0	0.2	0.3	99.7	
#16	1.6	0.6	0.5	99.5	
#30	29.8	28.2	9.8	90.2	
#50	151.9	122.1	49.7	50.3	
#100	242.8	90.9	79.5	20.5	
#200	271.2	28.4	88.7	11.3	
Pan	274.5				



#### **U.S. STANDARD SIEVE NUMBERS**



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Sample #	Classification	% Gravel	% Sand	% Silt	% Clay	% Moist.	LL	PL	PI	Project:	CA HSR
SS05	SP) Poorly Graded San	0.3	88.5	11.3	0.0						
										TES#:	23502-ZS9
										Boring #	S0021R
										Date:	9/17/2013



# Sieve Analysis for Soil / Fine Aggregate ASTM C-136

 Project:
 CA HSR
 Technician:
 K. Ford

 Date:
 9/17/2013

 TES#:
 23502-ZS9
 Sample No.:
 MC06-1

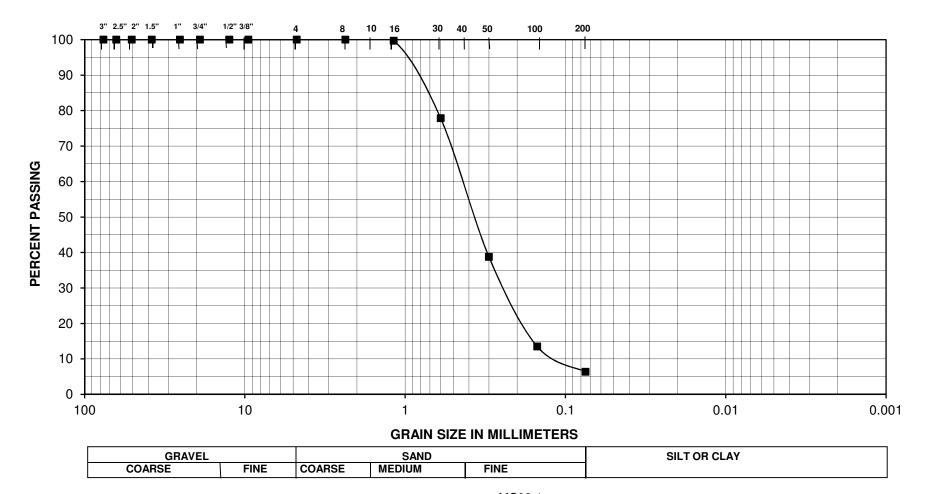
 Boring #:
 S0021R
 Classification:
 (SP) Poorly Graded Sand

	Weight	Maximum	Minimum Weight of
	(lbs. or grams)	Sieve Size	Test Specimen, lbs. (kg)
Total Dry Sample + Tare Wt.		Sand	1.0 (0.5)
Tare Weight		3/8"	2.0 (1.0)
Total Dry Sample Wt.	177.9	1/2"	4.0 (2.0)
Initial Weight Fine	177.9	3/4"	11.0 (5.0)
Aggregate Before Wash	177.9	1"	22.0 (10.0)
Final Weight Fine	167.4	1 1/2"	33.0 (15.0)
Aggregate After Wash	107.4	2"	44.0 (20.0)

	0	La alta dale dal	0	0	
	Cumulative	Individual	Cumulative	Cumulative	
Sieve	Weight	Weights	%	%	
Size	Retained	Retained	Retained	Passing	Specs.
3 in.			0.0	100.0	
2 1/2 in.			0.0	100.0	
2 in.			0.0	100.0	
1 1/2 in.			0.0	100.0	
1 in.			0.0	100.0	
3/4 in.			0.0	100.0	
1/2 in.			0.0	100.0	
3/8 in.			0.0	100.0	
#4	0.0	0.0	0.0	100.0	
#8	0.0	0.0	0.0	100.0	
#16	0.5	0.5	0.3	99.7	
#30	39.4	38.9	22.1	77.9	
#50	108.9	69.5	61.2	38.8	
#100	153.9	45.0	86.5	13.5	
#200	166.5	12.6	93.6	6.4	
Pan	167.4				



#### **U.S. STANDARD SIEVE NUMBERS**



—**■**— MC06-1

Sample #	Classification	% Gravel	% Sand	% Silt	% Clay	% Moist.	LL	PL	PI	Project:	CA HSR
MC06-1	(SP) Poorly Graded Sand	0	93.6	6.4	0.0						
										TES#:	23502-ZS9
										Boring #	S0021R
										Date:	9/17/2013



## Sieve Analysis for Soil / Fine Aggregate ASTM C-136

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Project:	CA HSR		Technician:	K. Ford			
			Date:	1/16/2014			
TES#:	23502-ZS9		Sample No.:	SS07			
Boring #:	S0021R; 30-31.5'	ı	Classification:	(SM/SP) Poorly Graded Sand			
			· 	, ,			
		Weight	Maximum	Minimum W	eight of		
		(lbs. or grams)	Sieve Size	Test Specime			
Total Dry S	ample + Tare Wt.		Sand	1.0 (0	.5)		
Tare Weigh	nt		3/8"	2.0 (1	.0)		
Total Dry S	ample Wt.	171.3	1/2"	4.0 (2	0)		
Initial Weig	ht Fine		3/4"	11.0 (5	5.0)		
Aggregate	Before Wash	171.3	1"	22.0 (1	0.0)		
Final Weigh	nt Fine		1 1/2"	33.0 (1			
Aggregate	After Wash	160.8	2"	44.0 (2	20.0)		
	Cumulative	Individual	Cumulative	Cumulative			
Sieve	Weight	Weights	%	%			
Size	Retained	Retained	Retained	Passing	Specs.		
3 in.			0.0	100.0			
2 1/2 in.	1		0.0	100.0			
2 in.			0.0	100.0			
1 1/2 in.			0.0	100.0			
1 in.			0.0	100.0			
3/4 in.			0.0	100.0			
1/2 in.			0.0	100.0			
3/8 in.			0.0	100.0			
#4	0.0	0.0	0.0	100.0			
#8	0.1	0.1	0.1	99.9			
#16	0.6	0.5	0.4	99.6			
#30	39.7	39.1	23.2	76.8			
#50	125.2	85.5	73.1	26.9			
#100	150.6	25.4	87.9	12.1			
#200	159.0	8.4	92.8	7.2			
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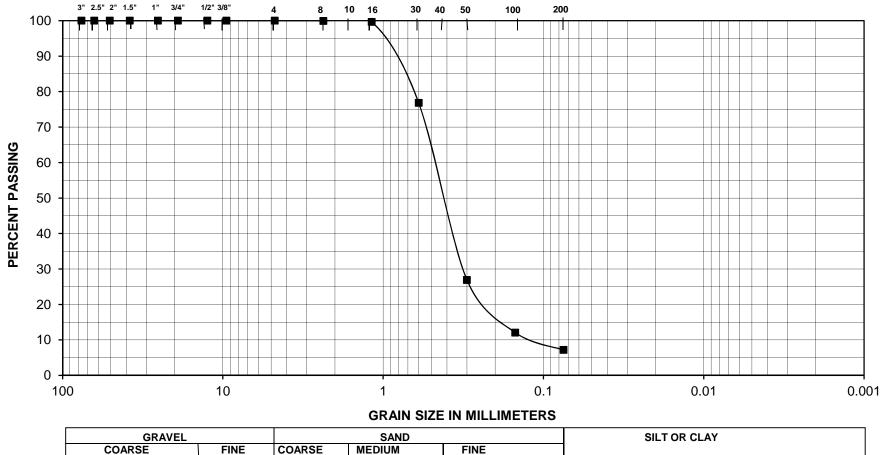
160.8

Pan



FINE

#### **U.S. STANDARD SIEVE NUMBERS**



Sample #	Classification	% Gravel	% Sand	% Silt	% Clay	% Moist.	LL	PL	PΙ	Project:	CA HSR
SS07	(SM/SP) Poorly Graded Sand	0	92.8	7.2							
										TES#:	23502-ZS9
										Boring #	S0021R; 30-31.5'
										Date:	1/16/2014



# Sieve Analysis for Soil / Fine Aggregate ASTM C-136

 Project:
 CA HSR
 Technician:
 K. Ford

 Date:
 9/17/2013

 TES#:
 23502-ZS9
 Sample No.:
 MC08-1

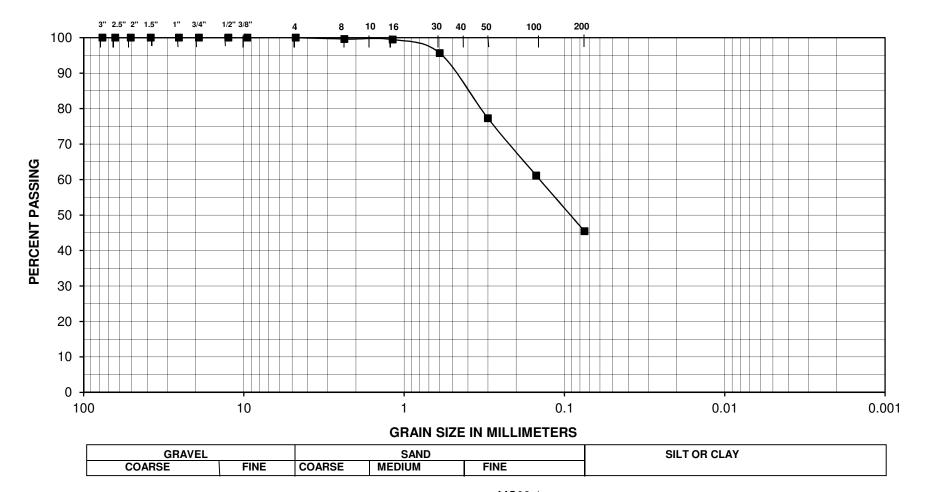
 Boring #:
 S0021R
 Classification:
 (SM) Silty Sand

	Weight	Maximum	Minimum Weight of
	(lbs. or grams)	Sieve Size	Test Specimen, lbs. (kg)
Total Dry Sample + Tare Wt.		Sand	1.0 (0.5)
Tare Weight		3/8"	2.0 (1.0)
Total Dry Sample Wt.	128.9	1/2"	4.0 (2.0)
Initial Weight Fine	128.9	3/4"	11.0 (5.0)
Aggregate Before Wash	120.9	1"	22.0 (10.0)
Final Weight Fine	77.3	1 1/2"	33.0 (15.0)
Aggregate After Wash	11.3	2"	44.0 (20.0)

	Cumulative	Individual	Cumulative	Cumulative	
Sieve	Weight	Weights	%	%	
Size	Retained	Retained	Retained	Passing	Specs.
3 in.			0.0	100.0	
2 1/2 in.			0.0	100.0	
2 in.			0.0	100.0	
1 1/2 in.			0.0	100.0	
1 in.			0.0	100.0	
3/4 in.			0.0	100.0	
1/2 in.			0.0	100.0	
3/8 in.			0.0	100.0	
#4	0.0	0.0	0.0	100.0	
#8	0.5	0.5	0.4	99.6	
#16	0.7	0.2	0.5	99.5	
#30	5.6	4.9	4.3	95.7	
#50	29.3	23.7	22.7	77.3	
#100	50.1	20.8	38.9	61.1	
#200	70.3	20.2	54.5	45.5	
Pan	77.3				



#### **U.S. STANDARD SIEVE NUMBERS**



### —**■**— MC08-1

Sample #	Classification	% Gravel	% Sand	% Silt	% Clay	% Moist.	LL	PL	PI	Project:	CA HSR
MC08-1	(SM) Silty Sand	0	54.5	45.5	0.0						
										TES#:	23502-ZS9
										Boring #	S0021R
										Date:	9/17/2013



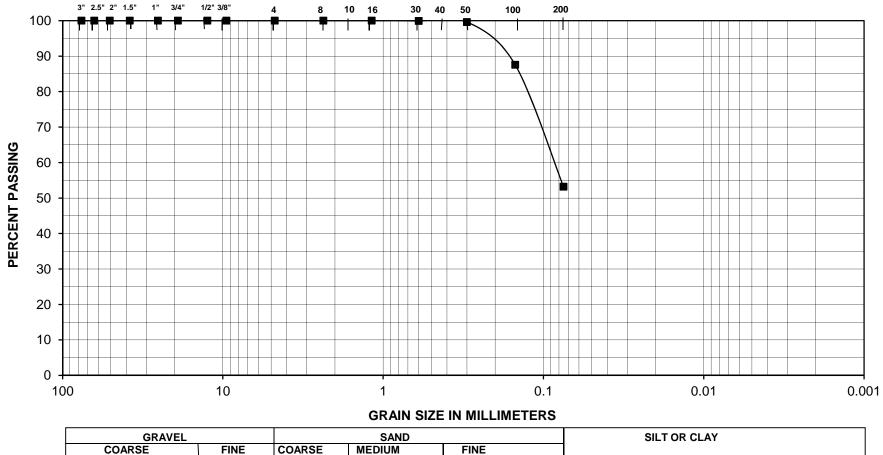
## Sieve Analysis for Soil / Fine Aggregate ASTM C-136

Project:	CA HSR		Technician:	K. Ford		
			Date:	1/16/2014		
TES#:	23502-ZS9		Sample No.:	MC10-1		
Boring #:	S0021R; 46-46.5	1	Classification:	(SM/ML) Sandy Silt		
			1	T		
		Weight	Maximum	Minimum W	•	
		(lbs. or grams)	Sieve Size	Test Specimen, lbs. (kg)		
Total Dry S	Sample + Tare Wt.		Sand	1.0 (0	.5)	
Tare Weig	ht		3/8"	2.0 (1.0)		
Total Dry S	Sample Wt.	180.2	1/2"	1/2" 4.0 (2.0)		
Initial Weig	ght Fine		3/4"	11.0 (5.0)		
Aggregate	Before Wash	180.2	1"	22.0 (1	22.0 (10.0)	
Final Weig	ht Fine		1 1/2"	33.0 (1	5.0)	
Aggregate	After Wash	115.2	2"	44.0 (2	0.0)	
	Cumulative	Individual	Cumulative	Cumulative		
Sieve	Weight	Weights	%	%		

	Cumulative	Individual	Cumulative	Cumulative	
Sieve	Weight	Weights	%	%	
Size	Retained	Retained	Retained	Passing	Specs.
3 in.			0.0	100.0	
2 1/2 in.			0.0	100.0	
2 in.			0.0	100.0	
1 1/2 in.			0.0	100.0	
1 in.			0.0	100.0	
3/4 in.			0.0	100.0	
1/2 in.			0.0	100.0	
3/8 in.			0.0	100.0	
#4	0.0	0.0	0.0	100.0	
#8	0.0	0.0	0.0	100.0	
#16	0.0	0.0	0.0	100.0	
#30	0.1	0.1	0.1	99.9	
#50	0.7	0.6	0.4	99.6	
#100	22.4	21.7	12.4	87.6	
#200	84.3	61.9	46.8	53.2	
Pan	115.2				



#### **U.S. STANDARD SIEVE NUMBERS**



—**■** MC10-1

Sample #	Classification	% Gravel	% Sand	% Silt	% Clay	% Moist.	LL	PL	PI	Project:	CA HSR
MC10-1	(SM/ML) Sandy Silt	0	46.8	53.2							
										TES#:	23502-ZS9
										Boring #	S0021R; 46-46.5"
										Date:	1/16/2014



# Sieve Analysis for Soil / Fine Aggregate ASTM C-136

 Project:
 CA HSR
 Technician:
 K. Ford

 Date:
 9/17/2013

 TES#:
 23502-ZS9
 Sample No.:
 SS11

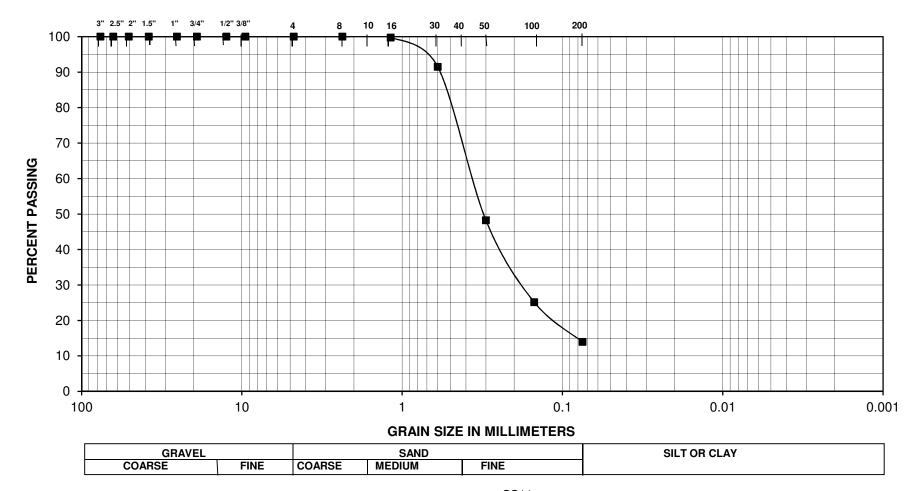
 Boring #:
 S0021R
 Classification:
 (SM) Silty Sand

	Weight (lbs. or grams)	Maximum Sieve Size	Minimum Weight of Test Specimen, lbs. (kg)		
Total Dry Sample + Tare Wt.		Sand	1.0 (0.5)		
Tare Weight		3/8"	2.0 (1.0)		
Total Dry Sample Wt.	233.3	1/2"	4.0 (2.0)		
Initial Weight Fine	233.3	3/4"	11.0 (5.0)		
Aggregate Before Wash	200.0	1"	22.0 (10.0)		
Final Weight Fine	204.8	1 1/2"	33.0 (15.0)		
Aggregate After Wash	204.0	2"	44.0 (20.0)		

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	Cumulative	Individual	Cumulative	Cumulative	
Sieve	Weight	Weights	%	%	
Size	Retained	Retained	Retained	Passing	Specs.
3 in.			0.0	100.0	
2 1/2 in.			0.0	100.0	
2 in.			0.0	100.0	
1 1/2 in.			0.0	100.0	
1 in.			0.0	100.0	
3/4 in.			0.0	100.0	
1/2 in.			0.0	100.0	
3/8 in.			0.0	100.0	
#4	0.0	0.0	0.0	100.0	
#8	0.0	0.0	0.0	100.0	
#16	0.6	0.6	0.3	99.7	
#30	19.8	19.2	8.5	91.5	
#50	120.8	101.0	51.8	48.2	
#100	174.6	53.8	74.8	25.2	
#200	200.7	26.1	86.0	14.0	
Pan	204.8				



#### **U.S. STANDARD SIEVE NUMBERS**



_	_ 221	
	_ 00 i	

Sample #	Classification	% Gravel	% Sand	% Silt	% Clay	% Moist.	LL	PL	PI	Project:	CA HSR
SS11	(SM) Silty Sand	0	86.0	14.0	0.0						
										TES#:	23502-ZS9
										Boring #	S0021R
										Date:	9/17/2013



# Sieve Analysis for Soil / Fine Aggregate ASTM C-136

 Project:
 CA HSR
 Technician:
 K. Ford

 Date:
 9/17/2013

 TES#:
 23502-ZS9
 Sample No.:
 SS13

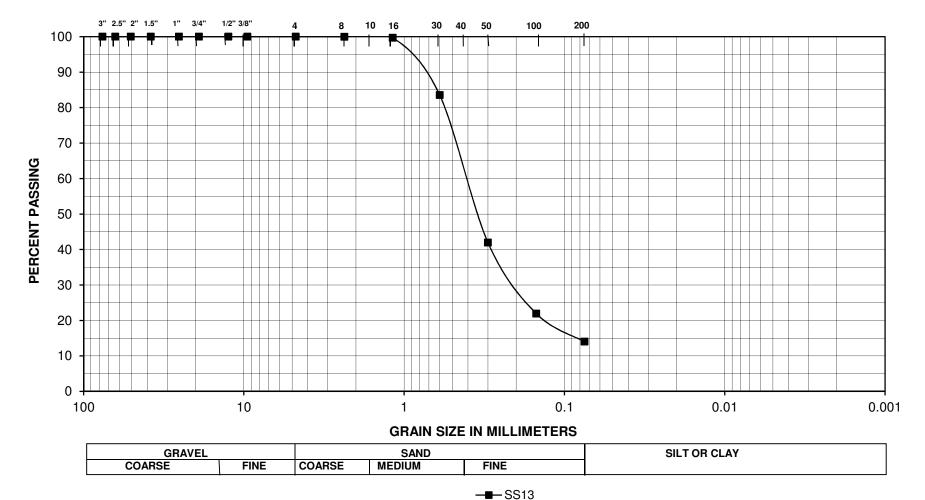
 Boring #:
 S0021R
 Classification:
 (SM) Silty Sand

	Weight (lbs. or grams)	Maximum Sieve Size	Minimum Weight of Test Specimen, lbs. (kg)
Total Dry Sample + Tare Wt.	<u> </u>	Sand	1.0 (0.5)
Tare Weight		3/8"	2.0 (1.0)
Total Dry Sample Wt.	249.7	1/2"	4.0 (2.0)
Initial Weight Fine	249.7	3/4"	11.0 (5.0)
Aggregate Before Wash	249.7	1"	22.0 (10.0)
Final Weight Fine	217.9	1 1/2"	33.0 (15.0)
Aggregate After Wash	217.9	2"	44.0 (20.0)

i <del></del>					
	Cumulative	Individual	Cumulative	Cumulative	
Sieve	Weight	Weights	%	%	
Size	Retained	Retained	Retained	Passing	Specs.
3 in.			0.0	100.0	
2 1/2 in.			0.0	100.0	
2 in.			0.0	100.0	
1 1/2 in.			0.0	100.0	
1 in.			0.0	100.0	
3/4 in.			0.0	100.0	
1/2 in.			0.0	100.0	
3/8 in.			0.0	100.0	
#4	0.0	0.0	0.0	100.0	
#8	0.1	0.1	0.0	100.0	
#16	0.8	0.7	0.3	99.7	
#30	41.1	40.3	16.5	83.5	
#50	144.9	103.8	58.0	42.0	
#100	194.9	50.0	78.1	21.9	
#200	214.6	19.7	85.9	14.1	
Pan	217.9				



#### **U.S. STANDARD SIEVE NUMBERS**



_ 001
_ 331

Sample #	Classification	% Gravel	% Sand	% Silt	% Clay	% Moist.	LL	PL	PI	Project:	CA HSR
SS13	(SM) Silty Sand	0	85.9	14.1	0.0						
										TES#:	23502-ZS9
										Boring #	S0021R
										Date:	9/17/2013



# Sieve Analysis for Soil / Fine Aggregate ASTM C-136

 Project:
 CA HSR
 Technician:
 K. Ford

 Date:
 9/17/2013

 TES#:
 23502-ZS9
 Sample No.:
 MC14-2

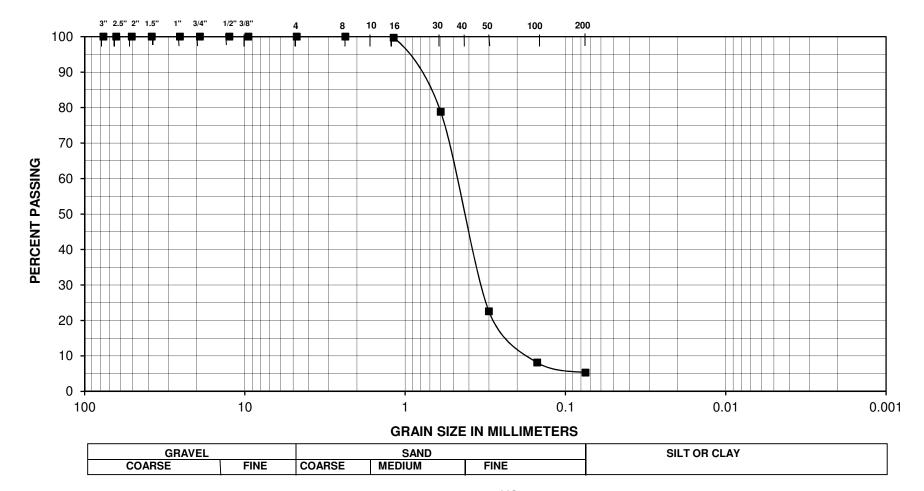
 Boring #:
 S0021R
 Classification:
 (SP) Poorly Graded Sand

	Weight	Maximum	Minimum Weight of
	(lbs. or grams)	Sieve Size	Test Specimen, lbs. (kg)
Total Dry Sample + Tare Wt.		Sand	1.0 (0.5)
Tare Weight		3/8"	2.0 (1.0)
Total Dry Sample Wt.	176.0	1/2"	4.0 (2.0)
Initial Weight Fine	176.0	3/4"	11.0 (5.0)
Aggregate Before Wash	170.0	1"	22.0 (10.0)
Final Weight Fine	167.2	1 1/2"	33.0 (15.0)
Aggregate After Wash	107.2	2"	44.0 (20.0)

	Cumulative	Individual	Cumulative	Cumulative	
Sieve	Weight	Weights	%	%	
Size	Retained	Retained	Retained	Passing	Specs.
3 in.			0.0	100.0	
2 1/2 in.			0.0	100.0	
2 in.			0.0	100.0	
1 1/2 in.			0.0	100.0	
1 in.			0.0	100.0	
3/4 in.			0.0	100.0	
1/2 in.			0.0	100.0	
3/8 in.			0.0	100.0	
#4	0.0	0.0	0.0	100.0	
#8	0.0	0.0	0.0	100.0	
#16	0.5	0.5	0.3	99.7	
#30	37.3	36.8	21.2	78.8	
#50	136.3	99.0	77.4	22.6	
#100	161.7	25.4	91.9	8.1	
#200	166.7	5.0	94.7	5.3	
Pan	167.2				



#### **U.S. STANDARD SIEVE NUMBERS**



#### —**■** MC14-2

Sample #	Classification	% Gravel	% Sand	% Silt	% Clay	% Moist.	LL	PL	ΡI	Project:	CA HSR
MC14-2	(SP) Poorly Graded Sand	0	94.7	5.3	0.0						
										TES#:	23502-ZS9
										Boring #	S0021R
										Date:	9/17/2013



# Sieve Analysis for Soil / Fine Aggregate ASTM C-136

 Project:
 CA HSR
 Technician:
 K. Ford

 Date:
 9/17/2013

 TES#:
 23502-ZS9
 Sample No.:
 MC16-2

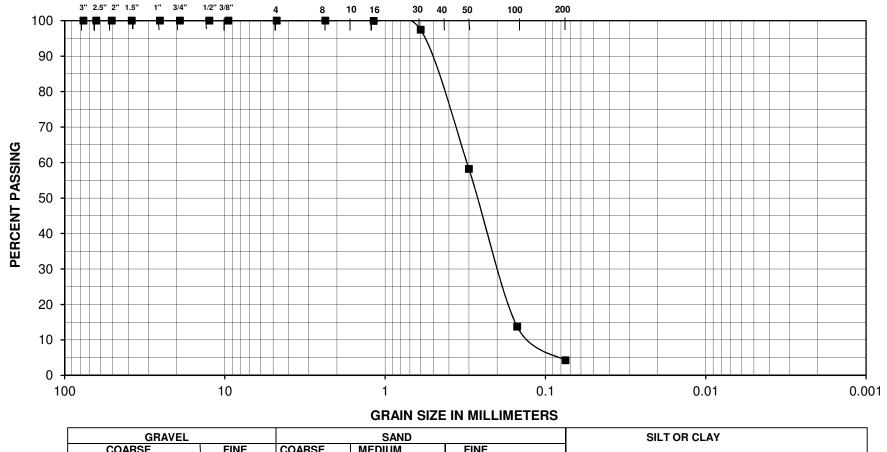
 Boring #:
 S0021R
 Classification:
 (SP) Poorly Graded Sand

	Weight	Maximum	Minimum Weight of
	(lbs. or grams)	Sieve Size	Test Specimen, lbs. (kg)
Total Dry Sample + Tare Wt.		Sand	1.0 (0.5)
Tare Weight		3/8"	2.0 (1.0)
Total Dry Sample Wt.	186.6	1/2"	4.0 (2.0)
Initial Weight Fine	186.6	3/4"	11.0 (5.0)
Aggregate Before Wash	100.0	1"	22.0 (10.0)
Final Weight Fine	178.8	1 1/2"	33.0 (15.0)
Aggregate After Wash	170.0	2"	44.0 (20.0)

	Cumulative	Individual	Cumulative	Cumulative	
Sieve	Weight	Weights	Veights %		
Size	Retained	Retained	Retained	Passing	Specs.
3 in.			0.0	100.0	
2 1/2 in.			0.0	100.0	
2 in.			0.0	100.0	
1 1/2 in.			0.0	100.0	
1 in.			0.0	100.0	
3/4 in.			0.0	100.0	
1/2 in.			0.0	100.0	
3/8 in.			0.0	100.0	
#4	0.0	0.0	0.0	100.0	
#8	0.0	0.0	0.0	100.0	
#16	0.1	0.1	0.1	99.9	
#30	4.8	4.7	2.6	97.4	
#50	78.0	73.2	41.8	58.2	
#100	161.0	83.0	86.3	13.7	
#200	178.6	17.6	95.7	4.3	
Pan	178.8				



#### **U.S. STANDARD SIEVE NUMBERS**



GRAVEL			SAND		SILT OR CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	

### **—**■— MC16-2

Sample #	Classification	% Gravel	% Sand	% Silt	% Clay	% Moist.	LL	PL	PI	Project:	CA HSR
MC16-2	(SP) Poorly Graded Sand	0	95.7	4.3	0.0					-	
										TES#:	23502-ZS9
										Boring #	S0021R
										Date:	9/17/2013



# Sieve Analysis for Soil / Fine Aggregate ASTM C-136

 Project:
 CA HSR
 Technician:
 K. Ford

 Date:
 9/17/2013

 TES#:
 23502-ZS9
 Sample No.:
 SS17

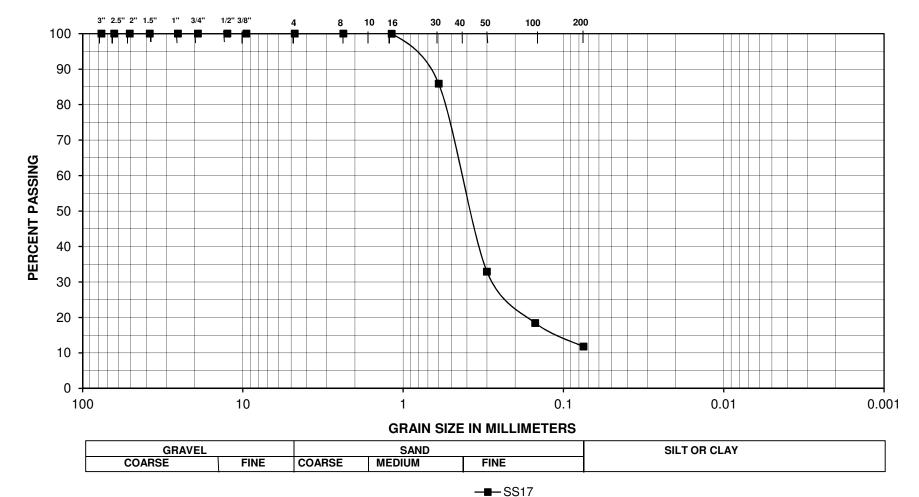
 Boring #:
 S0021R
 Classification:
 (SP) Poorly Graded Sand

	Weight	Maximum	Minimum Weight of
	(lbs. or grams)	Sieve Size	Test Specimen, lbs. (kg)
Total Dry Sample + Tare Wt.		Sand	1.0 (0.5)
Tare Weight		3/8"	2.0 (1.0)
Total Dry Sample Wt.	244.5	1/2"	4.0 (2.0)
Initial Weight Fine	244.5	3/4"	11.0 (5.0)
Aggregate Before Wash	244.5	1"	22.0 (10.0)
Final Weight Fine	219.3	1 1/2"	33.0 (15.0)
Aggregate After Wash	219.3	2"	44.0 (20.0)

	Cumulative	Individual	Cumulative	Cumulative	
Sieve	Weight	Weights	Weights %		
Size	Retained	Retained	Retained	Passing	Specs.
3 in.			0.0	100.0	
2 1/2 in.			0.0	100.0	
2 in.			0.0	100.0	
1 1/2 in.			0.0	100.0	
1 in.			0.0	100.0	
3/4 in.			0.0	100.0	
1/2 in.			0.0	100.0	
3/8 in.			0.0	100.0	
#4	0.0	0.0	0.0	100.0	
#8	0.0	0.0	0.0	100.0	
#16	0.1	0.1	0.0	100.0	
#30	34.5	34.4	14.1	85.9	
#50	164.0	129.5	67.1	32.9	
#100	199.4	35.4	81.6	18.4	
#200	215.7	16.3	88.2	11.8	
Pan	219.3				



#### **U.S. STANDARD SIEVE NUMBERS**



_	_ 221	
	_ 331	

Sample #	Classification	% Gravel	% Sand	% Silt	% Clay	% Moist.	LL	PL	PI	Project:	CA HSR
SS17	(SP) Poorly Graded Sand	0	88.2	11.8	0.0						
										TES#:	23502-ZS9
										Boring #	S0021R
										Date:	9/17/2013



## Sieve Analysis for Soil / Fine Aggregate ASTM C-136

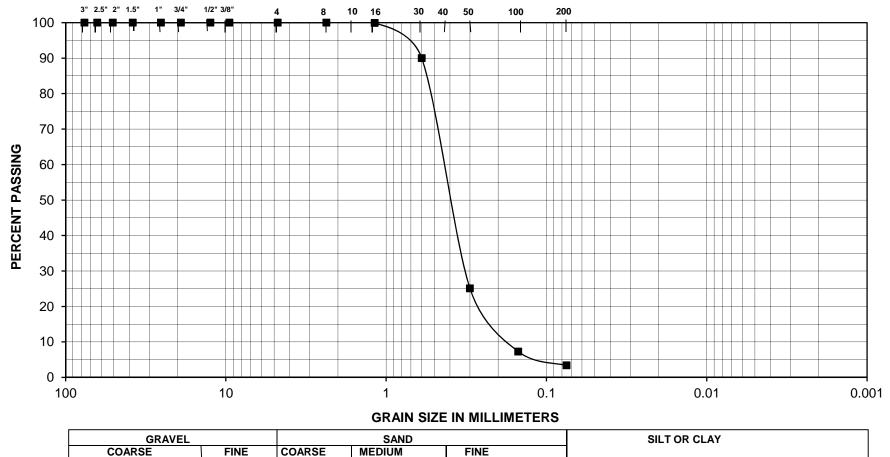
Project:	CA HSR		Technician:	K. Ford	
			Date:	1/16/2014	
TES#:	23502-ZS9		Sample No.:	MC18-1	
Boring #:	S0021R; 86-86.5'		Classification:	(SP) Poorly Grade	ed Sand
		Weight	Maximum	Minimum W	eight of
		(lbs. or grams)	Sieve Size	Test Specime	n, lbs. (kg)
Total Dry Sa	ample + Tare Wt.		Sand	1.0 (0	.5)
Tare Weigh	t		3/8"	2.0 (1	.0)
Total Dry Sa	ample Wt.	184.8	1/2"	4.0 (2	.0)
Initial Weigl	nt Fine		3/4"	11.0 (5	5.0)
Aggregate I	Before Wash	184.8	1"	22.0 (1	0.0)
Final Weigh	nt Fine		1 1/2"	33.0 (15.0)	
Aggregate /	After Wash	179.5	2"	44.0 (2	0.0)
	Cumulative	Individual	Cumulative	Cumulative	
Sieve	Weight	Weights	%	%	
Size	Retained	Retained	Retained	Passing	Specs.
3 in.			0.0	100.0	
2 1/2 in.			0.0	100.0	
2 in.			0.0	100.0	
1 1/2 in.			0.0	100.0	
1 in.			0.0	100.0	
3/4 in.			0.0	100.0	
1/2 in.			0.0	100.0	
3/8 in.			0.0	100.0	
#4	0.0	0.0	0.0	100.0	
#8	0.0	0.0	0.0	100.0	
#16	0.1	0.1	0.1	99.9	
#30	18.5	18.4	10.0	90.0	
#50	138.4	119.9	74.9	25.1	
#100	171.3	32.9	92.7	7.3	
#200	178.5	7.2	96.6	3.4	

179.5

Pan



#### **U.S. STANDARD SIEVE NUMBERS**

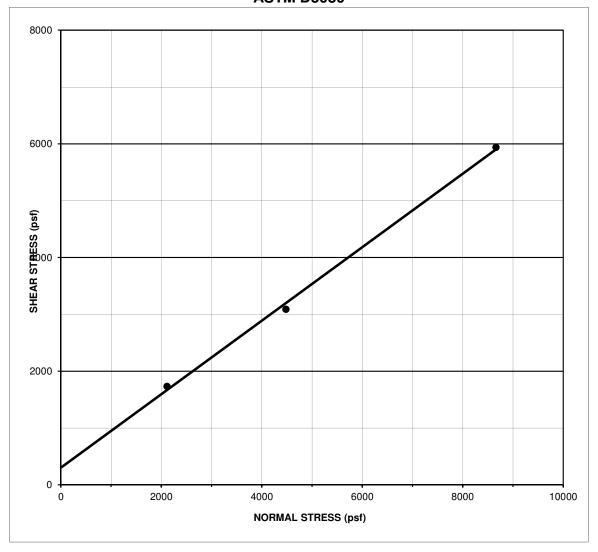


—**■** MC18-1

Sample #	Classification	% Gravel	% Sand	% Silt	% Clay	% Moist.	LL	PL	PI	Project:	CA HSR
MC18-1	(SP) Poorly Graded Sand	0	96.6	3.4							
										TES#:	23502-ZS9
										Boring #	S0021R; 86-86.5'
										Date:	1/16/2014



### Direct Shear Test ASTM D3080



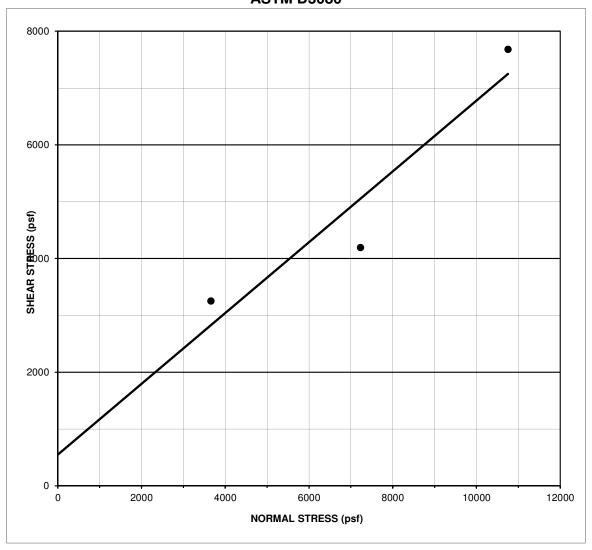
PROJECT:	HSR
TES NO.:	23502-ZS9
SAMPLE DATE.:	9/3/2013
BORING NO.:	S0021R
SAMPLE NO.:	MC02-1
DESCRIPTION:	Silty Sand (SM)

Cohesive Pressure, psf	300
Internal Friction Angle	33

SPECIMEN	Α	В	С	D	Е
DRY DENSITY (pcf)	106.9	106.9	106.9		
INITIAL WATER CONTENT (%)	4.5	4.5	4.5		
FINAL WATER CONTENT (%)	15.5	14.3	13.6		
NORMAL STRESS (psf)	2115	4481	8662		
MAXIMUM SHEAR (psf)	1734	3090	5939		



### Direct Shear Test ASTM D3080



PROJECT:	HSR
TES NO.:	23502-ZS9
SAMPLE DATE.:	9/3/2013
BORING NO.:	S0021R
SAMPLE NO.:	MC08-1
DESCRIPTION:	Silty Sand (SM)

Cohesive Pressure, psf	550
Internal Friction Angle	32

SPECIMEN	Α	В	С	D	E
DRY DENSITY (pcf)	117.6	117.6	117.6		
INITIAL WATER CONTENT (%)	10.8	10.8	10.8		
FINAL WATER CONTENT (%)	12.9	13.0	12.2		
NORMAL STRESS (psf)	3656	7232	10753		
MAXIMUM SHEAR (psf)	3253	4192	7680		



## ASTM D - 2844 / CAL 301

**Project Number** 23502-ZS9

Project Name **HSR** Date 9/17/13

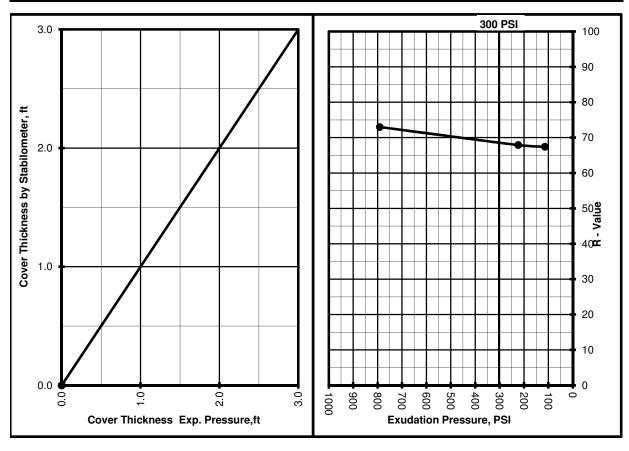
Sample Location/Curve Number **B-01 SURFACE** 

Soil Classification SP

Invoice

TEST	Α	В	С
Percent Moisture @ Compaction, %	7.8	8.5	8.1
Dry Density, lbm/cu.ft.	122.9	121.9	123.5
Exudation Pressure, psi	791	114	224
Expansion Pressure, (Dial Reading)	0	0	0
Expansion Pressure, psf	0	0	0
Resistance Value R	73	67	68

R Value at 300 PSI Exudation Pressure	(68)
R Value by Expansion Pressure (TI =): 5	Expansion Pressure Nil







# **ASTM D - 1557**

**Project Number** : 23502-ZS9

Project Name : HSR Date : 9/6/2013 Sample location : S0021R Sample/Curve Number : B-01 Soil Classification : SP Test Method : 1557A

	1	2	3	4
Weight of Moist Specimen & Mold, gm	7135.2	7250.6	7388.0	7420.2
Weight of Compaction Mold, gm	2858.2	2858.2	2858.2	2858.2
Weight of Moist Specimen, gm	4277.0	4392.4	4529.8	4562.0
Volume of mold, cu. ft.	0.0750	0.0750	0.0750	0.0750
Wet Density, lbs/cu.ft.	125.7	129.1	133.2	134.1
Weight of Wet (Moisture) Sample, gm	200.0	200.0	200.0	200.0
Weight of Dry (Moisture)Sample, gm	194.3	190.7	187.0	183.1
Moisture Content, %	2.9	4.9	7.0	9.2
Dry Density, lbs/cu.ft.	122.1	123.1	124.5	122.8

